DOCUMENT RESUME

ED 383 840 CE 069 133

TITLE	Legislative Principles for Career-Related Education and Training: What Research Supports.
INSTITUTION	National Center for Research in Vocational Education, Berkeley, CA.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE	Mar 95
CONTRACT	V051A30003-95A; V051A30004-94A
NOTE	33p.
AVAILABLE FROM	NCRVE Materials Distrectuion Service, 46 Horrabin Hall, Western Illinois University, Macomb, IL 61455 (order no. MDS-900: $5).
PUB TYPE	Information Analyses (070)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Academic Education; Career Counseling; Career Development; *Career Education; Cooperative Planning; Coordination; *Educational Legislation; Educational Planning; Educational Policy; *Educational Research; *Education Work Relationship; Evaluation Criteria; Federal Legislation; Financial Support; Integrated Curriculum; Lifelong Learning; Literature Reviews; Models; Partnerships in Education; Position Papers; Postsecondary Education; Program Development; *Public Policy; Resource Allocation; School Business Relationship; School Districts; Secondary Education; Specifications; Staff Development; Standards; State Federal Aid; Tech Prep; *Vocational Education

ABSTRACT

This position paper synthesizes the findings of a review of the literature on career-related education and training and recommends the following nine statements as guiding principles of legislation concerning career-related education and training: lifelong learning programs will be most effective if they combine academic and vocational content; all secondary-level students can benefit from having the option of pursuing a career-related course of study integrating academic and vocational content with work-based learning; postsecondary institutions should continue to broaden and deepen tech prep and other occupational programs; teachers, administrators, counselors and other staff need time and support to develop programs meeting these objectives; career-oriented information, development, and counseling services must be improved, expanded, and integrated into the curriculum; employers must be mobilized to collaborate in providing work-related education and training; performance measurement and standards should be used to gauge program success and guide program improvement; more federal funds should be distributed to low-income areas, and states should be encouraged to develop their own technical assistance programs; and collaboration among career-related education and training programs in different institutions or with different funding sources should be facilitated. (Contains 56 references.) (MN)

ED 383 840

National Center for Research in
Vocational Education

University of California at Berkeley

Legislative Principles for Career-Related Education and Training: What Research Supports

Supported by
the Office of Vocational and Adult Education,
U.S. Department of Education

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

CE 069 133

This publication is available from the:

National Center for Research in Vocational Education
Materials Distribution Service
Western Illinois University
46 Horrabin Hall
Macomb, IL 61455

800-637-7652 (Toll Free)
msmds@uxa.ecn.bgu.edu

Legislative Principles for Career-Related Education and Training: What Research Supports

NCRVE

National Center for Research in Vocational Education
Graduate School of Education
University of California at Berkeley
2150 Shattuck Avenue, Suite 1250
Berkeley, CA 94720-1674

Supported by
the Office of Vocational and Adult Education,
U.S. Department of Education

March 1995 MDS-900

Funding Information

Project Title:	National Center for Research in Vocational Education
Grant Number:	V051A30004-94A/V051A30003-95A
Act under which Funds Administered:	Carl D. Perkins Vocational Education Act P.L. 98-524
Source of Grant:	Office of Vocational and Adult Education U.S. Department of Education Washington, DC 20202
Grantee:	The Regents of the University of California National Center for Research in Vocational Education 2150 Shattuck Avenue, Suite 1250 Berkeley, CA 94704
Director:	David Stern
Percent of Total Grant Financed by Federal Money:	100%
Dollar Amount of Federal Funds for Grant:	$6,000,000
Disclaimer:	This publication was prepared pursuant to a grant with the Office of Vocational and Adult Education, U.S. Department of Education. Grantees undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." Therefore, the National Center for Research in Vocational Education project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

Table of Contents

Introduction 1

Proposed Principles for New Federal Legislation 3

Discussion of the Proposed Principles 5

- Principle #1—Lifelong Learning 5
- Principle #2—Secondary Schools 8
- Principle #3—Postsecondary Institutions 11
- Principle #4—Staff Development and Planning 12
- Principle #5—Career Development and Counseling 13
- Principle #6—Employer Collaboration 15
- Principle #7—Performance Measures and Standards 16
- Principle #8—Distribution of Federal Funds 18
- Principle #9—Local Coordination of Programs 19

References 21

INTRODUCTION

Expiration of the Carl D. Perkins Vocational and Applied Technology Education Act and of the Adult Education Act later this year makes it necessary to consider Federal priorities in work-related education and training. This statement, prepared by the National Center for Research in Vocational Education (NCRVE),* recommends nine principles for new Federal legislation. The views given here are based on NCRVE research and collaboration with schools, colleges, and other agencies since 1988.

We believe that legislation regarding career-related education and training should be derived from up-to-date knowledge about what is most effective for the participants in these programs, subject to budget constraints. In this statement, we therefore propose a consistent set of principles that can serve as a framework for new Federal legislation, rather than spell out legislative recommendations in detail.

These principles can be applied to a wide range of work-related education and training, including programs for out-of-school youth and adults as well as formal schooling. However, since NCRVE's mission emphasizes schools and colleges, our proposed principles for new Federal legislation refer particularly to programs in secondary and postsecondary education.

We believe that the Federal Government can assume a key role in developing and implementing career-related education and job training based on these principles. Such a role would involve providing financial incentives and technical assistance.

This report is intended to be useful to a wide audience, including education policymakers and practitioners, elected officials, and members of Federal and State organizations. The National Center's nine proposed principles for new Federal legislation are listed on the next page. Readers may turn to the rest of the report for a more detailed discussion of each principle. At the conclusion of this report is a list of References for those who seek further information about the topics discussed here.

*The National Center, authorized under the Carl D. Perkins Act, is composed of eight organizations. The University of California at Berkeley is the lead institution, and its partners are the University of Illinois, University of Minnesota, MPR Associates, RAND, Teachers College at Columbia University, the University of Wisconsin at Madison, and Virginia Polytechnic Institute and State University. This statement has been drafted by the Board representing the eight institutions.

Proposed Principles for New Federal Legislation

1 The increasing demand for continual learning throughout the working career implies that career-related education and training programs will be most effective if they combine academic and vocational content, integrate work-based with school-based learning, and ensure that each program can lead to more advanced programs.

2 In secondary schools, all students—including those who expect to attend four-year colleges or universities, as well as students at risk of not completing high school—can benefit from having the option to pursue a career-related course of study that integrates academic and vocational content with work-based learning.

3 Postsecondary institutions should continue to broaden and deepen tech-prep and other occupational programs, combining vocational and academic content and strengthening connections with the labor market.

4 Teachers, administrators, counselors, and other staff need time and support to develop programs that meet these objectives.

5 Career-oriented information, development, and counseling services ought to be improved, expanded, and integrated into the curriculum.

6 Employers must be mobilized to collaborate in providing work-related education and training.

7 Performance measures and standards should continue to be used to gauge the success of programs and guide their continuous improvement; these program measures should incorporate newly developing academic and occupational skill standards for individuals.

8 While Federal funds should be distributed in greater amounts to low-income areas, states should be encouraged to develop their own programs of technical assistance for program improvement, including the possibility of targeting funds on high-performing programs.

9 Collaboration among career-related education and training programs in different institutions, or with different funding sources, is desirable and can be facilitated if all programs adhere to the same principles, such as those stated in principle 1 above.

Discussion of the Proposed Principles

The increasing demand for continual learning throughout the working career implies that career-related education and training programs will be most effective if they combine academic and vocational content, integrate work-based with school-based learning, and ensure that each program can lead to more advanced programs.

The United States and other industrialized countries are moving toward a learning-based economy. Increasingly rapid mobility of capital and information forces firms to become ever more nimble. The accelerating pace of change within organizations and mobility of people among workplaces require everyone to keep learning all the time. Learning includes the transfer of existing information, knowledge, and skill from those who have them to those who need them; it also includes the discovery of previously unknown facts and principles to improve products, services, and methods of production. This is a learning-based economy, where the success of individuals, companies, and nations depends increasingly on how well and how fast they can learn (Bailey, 1990; Brown, Reich, and Stern, 1991).

In many countries, this development is reflected in new conceptions of work-related education and training. The key elements of the emerging model are closer integration of vocational and academic studies, greater use of practical work experience along with classroom learning, and better opportunity for participants in work-related programs to continue their preparation at more advanced levels. In the United States, these changes have begun to occur in secondary schools and postsecondary educational institutions. As stated in the discussion of principles 2 and 3, we believe that more secondary school and college programs should be created along these lines. These ideas can also be applied to work-related programs for out-of-school youth, employed or unemployed adults, welfare recipients, and others who participate in work-related education and training.

The key elements of this new model are as follows:

- First, integration of vocational and academic content is intended to ensure that today's student or trainee acquires sufficient understanding of the concepts necessary to adapt to tomorrow's conditions. Attention is given to many aspects of an industry or occupation, not just to specific skills required in entry-level jobs. In school or college, this means breaking down existing boundaries

between academic disciplines—including such traditional subjects as mathematics, language, science, and social studies—and vocational specialties—such as health occupations, electronics and computers, office management, construction careers, diagnosis and repair of mechanical systems, and banking and finance. In practice, efforts to combine academic and vocational content have ranged from simply adding instruction in basic academic skills to vocational courses, to creating multi-year interdisciplinary programs that reorganize the entire curriculum around a career-related theme (Grubb et al., 1991).

- Second, making work-based learning an integral part of the instructional program enables students or trainees to use the workplace to build their own knowledge and skill. This provides practice in the kind of learning-in-context that is increasingly required for career mobility and participation in flexible organizations. Work-based learning coupled with classroom instruction is part of the traditional apprenticeship model; it is also a feature of cooperative education, career academies, new youth apprenticeships, and some programs for out-of-school youth (Stern et al., 1994b). In secondary and postsecondary education, school-based enterprises also provide opportunities for work-based learning by engaging students in the provision of goods or services—for example, building houses, publishing books, running restaurants, or conducting research—as part of their instruction (Stern et al., 1994a).

- Third, the emerging model of career-related education and training is designed to ensure that students or trainees retain the option of continuing their studies at a more advanced level. In the learning-based economy, this means that individuals can use the educational system in the future if they want to make a career change, or are forced to do so.

These three elements reinforce each other. Combining academic and vocational instruction lets students or trainees get more out of work-based learning, by explaining the conceptual significance of issues that arise in the work situation. It also keeps their options open for further education—both by satisfying academic prerequisites and by improving individuals' access to higher paying jobs, through which they can more easily finance further schooling.

Similarly, integrating work-based learning with classroom instruction can connect theory and practice. This not only gives students new insights and motivation in academic subjects but also deepens the content of vocational studies. Using work to reinforce schooling, rather than allowing it to undermine schooling—as sometimes happens when students are employed in jobs that are not connected to school—also helps prevent some students from dropping out and, thus, protects their option to pursue further education.

Finally, preserving the option of continuing studies at a more advanced level helps ensure that a program will attract some of the more ambitious and talented who are seeking rigorous academic preparation combined with practical studies. This also enhances work-based learning, because students or trainees who are considering further education are more likely to be interested in trying out a wide range of work roles and exploring many aspects of an industry.

There is evidence that programs exhibiting some or all of these features are effective. For example, career academies organize two to four years of high school around an occupational theme such as health occupations, finance, computers, communications media, or electronics. In career academies, academic and vocational teachers work together to integrate the curriculum, and students have paid jobs or unpaid internships related to their field of study. After graduation, although some students enter full-time employment in the field, many go directly to college, despite the fact that career academies sometimes recruit high proportions of freshmen or sophomores who are evidently at risk of not completing high school. Evaluations have found that career academy students perform better in school than do comparable students from the same high schools (Stern, Raby, and Dayton, 1992). Likewise, career magnet high schools, which also blend the academic and vocational curriculum and send graduates to work and college, have been found to improve students' school performance (Crain et al., 1992).

Using work to reinforce schooling, rather than allowing it to undermine schooling . . . also helps prevent some students from dropping out and, thus, protects their option to pursue further education.

Recent Federal legislation, with bipartisan support, has given impetus to these ideas. In particular, the 1990 Amendments to the Carl Perkins Act mandated the integration of academic and vocational education, partly in response to employers' demands for workers who are better prepared for the learning-based economy. Academic–vocational integration was further endorsed in 1994 by the School-to-Work Opportunities Act (STWOA) and the reauthorization of the Elementary and Secondary Education Act. The STWOA also promotes work-based learning tied to classroom instruction, and preserving students' option to pursue further education or training.

These ideas imply major changes in conventional practice, and even with Federal backing, they need time to take hold. The reforms that the 1990 Amendments to the Carl Perkins Act set in motion are considerable, as the report of the National Assessment of Vocational Education (1994) indicates. But they have only begun to occur. This is not surprising when we consider that the Amendments have been in effect for only a few years, while the divisions between academic and vocational education have existed much longer. Implementing an up-to-date system of work-related education and training will require new Federal legislation that builds upon the initiatives of 1990 and 1994, and tries to consolidate them within the educational system and extend them to programs for out-of-school youth and adults.

In order to sustain reform efforts, Congress should consider lengthening the time period over which it authorizes legislation. The current five-year cycle is too short, because changes must be evaluated in their first and second years in order for Congressional deliberations to begin in year five. Congress might consider a cycle of seven to ten years instead.

In secondary schools, all students—including those who expect to attend four-year colleges or universities, as well as students at risk of not completing high school—can benefit from having the option to pursue a career-related course of study that integrates academic and vocational content with work-based learning.

Historically vocational education and academic education have been badly divided, to the detriment of both. The 1990 Amendments to the Carl Perkins Act took a first step toward ending this division with the requirement to integrate academic and vocational education. New Federal legislation can now encourage the further development of these integrated programs where they already exist, and can promote their more widespread diffusion. A worthy goal would be for every public high school student in the nation to have the option of pursuing a high-quality career-related course of study.

The further development of secondary school programs can proceed along several lines.

- The integration of academic and vocational education would continue, with the goal of moving secondary schools from less thorough forms of integration (e.g., applied academics courses, or collaboration between two teachers) toward forms of integration in which a number of teachers collaborate to create an occupationally focused program. These programs might take various forms, including career academies or schools-within-schools, career-oriented clusters or majors that every student in a particular high school could elect, or occupationally oriented magnet schools.

- Career academies, majors, and magnet schools would focus on a broad range of occupations and many aspects of an industry, rather than specific entry-level jobs as has been true in traditional vocational education. The career theme could be defined in terms of related occupations (e.g., health occupations) or as occupations within a given industry (e.g., those related to agriculture, which includes scientists and managers as well as farmers) (Hoachlander, 1994).

- The goals of work-oriented education would be broader than those of either traditional academic or vocational education: they would prepare students either for employment after high school or postsecondary education, or for the combination of employment and further education that has become so common. Courses that teach only job-specific skills for entry-level work right after high school would be eliminated, unless they can be incorporated into a broader course of study that provides knowledge and competence necessary for the long run.

- This approach to work-oriented education would require changes in academic and vocational instruction. Quite rightly, vocational teachers have complained that the burden of integrating academic and vocational education has often fallen entirely on them so far. In subsequent development, academic subjects would change as well, incorporating more occupationally relevant applications, examples, and projects, as well as themes that are important to broadly defined occupations.

- The pedagogy in high schools would also change in favor of teaching based on current conceptions of learning, more student-centered instruction, small-group and cooperative instruction, project- and experienced-based learning, and other practices that have been more common in the best vocational education (and also in the most elite academic education).

- These integrated high school programs would explicitly create links to postsecondary institutions of all kinds, extending the practices associated with tech-prep programs, and dispelling the notion that these are programs only for the "non-college bound." The danger in limiting programs to the "non-college bound" is that they will be viewed as second-best. Students segregated into non-academic programs, whether they be vocational education, general education, or special education programs, are frequently given a watered-down curriculum and teachers who have low expectations for their achievement (Oakes et al., 1992). Also, students placed into "lower" tracks tend to be disproportionately poor or minority (O'Neil, 1993). Tracking and other forms of homogeneous grouping increase social segregation, deny many students the opportunity to learn from more accomplished students, and contribute to substandard outcomes (Maddy-Bernstein and Coyle-Williams, in press). To avoid these adverse outcomes, instructional objectives should be identical for all students, as embodied in newly developing skill and knowledge standards for occupations and academic subjects. (See principle 7.)

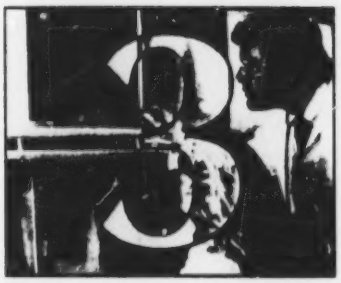
The goals of work-oriented education would be broader than those of either traditional academic or vocational education: they would prepare students either for employment after high school or postsecondary education, or for the combination of employment and further education that has become so common.

Resources are required to provide teaching materials, equipment, and curricula that accommodate the individual learning methods of all students. The 1990 Perkins Act began to provide the framework to eliminate dual tracks by supporting the integration of academic and vocational programs and concentrating resources on students with special needs. When coupled with individual student assessment and appropriate pedagogy such as cooperative learning and a curriculum based on realistic projects, this approach can include students who reflect the race, gender, disability status, and other diverse characteristics of the general population (Eagle et al., 1989; Phelps and Wermuth, 1992; Baker, Wang, and Walberg, 1994–95; Staub and Peck, 1994–95).

- In conjunction with classroom instruction, various work-based learning opportunities would be provided in businesses, school-based enterprises, and nonprofit or public service agencies. Providing tangible goods and productive services gives students a chance to confront real problems with immediate consequences for people other than themselves. In addition to knowledge and skills specific to a particular kind of job, students also develop generic work skills (Stasz et al., 1992; Raizen, 1989), including the ability to take charge of their own learning in a work setting. And they can use the workplace as a laboratory to test ideas and concepts from their classes in school.

- The kind of secondary education described here implies a new legal definition of vocational education. Federal law has defined vocational education as preparation for "occupations requiring other than a baccalaureate or advanced degree." However, this definition is out of date because some occupations that are incorporated into clusters would require baccalaureate or advanced degrees (e.g., doctors in a health cluster or engineers in a manufacturing technologies curriculum).

This vision of career-oriented high school options is consistent with numerous other strands of high school reform (Andrew and Grubb, 1995). These include the proposals to create "focus schools" and charter schools (Hill, Foster, and Gendler, 1990); the increased interest in magnet schools; the "restructuring movement" that allows individual schools greater control to create schools with a particular emphasis; the shift toward more active teaching methods; the call for small schools or schools-within-schools (Meier, 1991); and the general interest in integrated curricula (e.g., Jacobs, 1989). What we are proposing is that, among the other curricular options available, every student should have access to at least one option that is career-oriented. As John Dewey declared, "education *through* occupations consequently combines within itself more of the factors conducive to learning than any other method" (Dewey, 1916, Ch. 23, p. 309).



Postsecondary institutions should continue to broaden and deepen tech-prep and other occupational programs, combining vocational and academic content and strengthening connections with the labor market.

The 1990 Amendments promoted two practices that are particularly relevant to community colleges and technical institutes: the integration of academic and vocational education, and tech prep. While interest in curriculum integration in community colleges initially lagged behind such interest in high schools (Grubb and Stasz, 1993; NAVE, 1994, Vol. III, Ch. 4), recently there has been an upsurge of attention that should continue, in order to help ensure that postsecondary occupation programs provide a broad range of competencies. Similarly, while tech-prep programs generated considerable interest in community colleges, most of the changes occurring have affected high school practices rather than postsecondary ones (NAVE, 1994, Vol. III, Ch. 5; Bragg, Layton, and Hammons, 1994). To assure a well-integrated, demanding curriculum for students entering from high school tech-prep programs, continued support for tech prep should stress the need to change curricula and teaching methods in community colleges.

In general, the economic benefits of postsecondary occupational education are positive, particularly for those completing associate degrees and certificates (NAVE, 1994, Vol. II, Ch. 6). However, overall positive effects mask much variation. For example, the economic benefits vary widely among different occupational areas; the benefits are more substantial for individuals who complete programs, compared with those completing coursework but not programs; some individuals who enroll in community colleges without completing programs do not benefit at all; and those who find employment related to their area of study benefit more than do those in unrelated employment (Grubb, 1992, 1993, 1994; Kane and Rouse, 1993).

One explanation for the variation in the economic benefits of community colleges is that the extent of their connections to employers varies substantially (Grubb et al., 1992). To be sure, community colleges have several ways of establishing connections with local employers. These include advisory committees; placement offices; student follow-up and tracking mechanisms; contract education, which provides instruction to particular firms; work experience and co-op programs; the patterns of student enrollment, which sometimes fall when labor market demand falls; and, in a few areas like health occupations, licensing requirements. However, while some institutions have developed connections that link their programs closely with employers, in other institutions these mechanisms work poorly, and students may have greater difficulty finding local employment related to their area of study.

Therefore, Federal legislation should provide funding for postsecondary institutions to strengthen their connections with employers, including high-quality work experience and co-op programs, improved placement efforts, and student follow-up systems to provide information where students are employed. In addition, the continued development of skill standards can help bring employers and education providers together.

Teachers, administrators, counselors, and other staff need time and support to develop programs that meet these objectives.

For the programs we are describing to be successful, it is crucial that educators and trainers engage in regular, systematic staff development activities designed to help them learn ways to improve the academic success of the diverse groups in their charge. To realize this goal, new Federal legislation should increase support for professional development activities for teachers and instructors, administrators, counselors, and others with the ability to influence change.

Schools and colleges that have tried to combine an integrated curriculum with work-based learning have found that staff development and teacher preparation are key aspects of improvement. Several distinct capacities are important to these changes (Schmidt, 1992). One is the ability to collaborate with other teachers, usually across disciplines. A second is knowledge about the world of work, which especially has to be developed by academic instructors with little work experience outside educational institutions; sometimes this is accomplished with internships or placements in work settings during a summer, for example. Third, many instructors at all levels need support in shifting their methods of teaching to those that are more work-based, student-oriented, and project-centered.

Support for instructors may be even more crucial for postsecondary institutions than for secondary schools. Unlike secondary schools, where teacher training is normally required, preparing postsecondary instructors for their teaching responsibilities is much less common. Aside from degree requirements, most states do not have credentialing requirements for community college instructors (McDonnell and Zellman, 1993), and staff development and in-service education are erratic. To prepare postsecondary instructors for teaching that is both more interdisciplinary and more active, a coherent approach to the preparation and in-service education of community college instructors is necessary.

To be sure, support for staff development was incorporated into the 1990 Amendments to the Carl Perkins Act. However, much of this has been limited to one-shot rather than

sustained efforts. We recommend that Federal legislation support more powerful forms of staff development, including summer institutes, professional development schools, work placements, and continuing assistance to teachers at their own schools and institutions. Also, little attention has been paid to developing preservice programs that prepare instructors to provide work-related education; Federal legislation could provide support for creating new models.

In addition to teachers, administrators also need time and support to develop new programs. Career academies, clusters, and majors all imply significant changes in class scheduling, student grouping, and other aspects of school operations. Coordination among schools, colleges, employers, and non-school agencies involved in job training also requires new awareness and activity on the part of administrators (Finch et al., 1992).

Finally, professional development opportunities must be provided for counselors, as emphasized in principle 5.

Career-oriented information, development, and counseling services ought to be improved, expanded, and integrated into the curriculum.

The efforts to reform vocational education begun by the 1990 Amendments have clarified the inadequacies of existing information and counseling services. At both the secondary and postsecondary levels, most instructors neglect to provide students with any clear understanding of the career options and pathways in various sectors of the economy, and few can help them make useful plans for career preparation and advancement. The initial development of career academies, clusters, and magnet schools has highlighted the need for guidance and counseling so that students can make informed decisions about their high school programs. The effort to include all students, from the developmentally disabled to the academically gifted, also places increased demands on counselors and instructors to help develop plans for individual students. These new demands are appearing at the same time that resources for career-oriented information have been dwindling.

At the postsecondary level, the growth in enrollment of adults with complex educational requirements has expanded the need for various support services that include counseling. There is very little information available to help individuals choose among the work-related education and training options available locally. And once these initial enrollment decisions are made, most postsecondary institutions have only limited resources and expertise to provide career planning and counseling to adults. Because

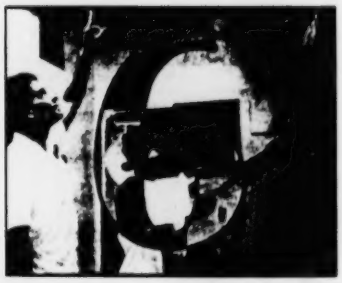
the offices of the Job Service and Vocational Rehabilitation are seldom closely linked with counseling offices at community and technical colleges, many special population adults do not receive critical services and information.

. . . in many cases, there simply is not enough information available to help young people make appropriate decisions about their occupational futures.

As a first step, therefore, Federal legislation should support the development of better information for prospective students about alternative careers, including the benefits of different occupational programs. States could use Federal funds to strengthen their career development systems to ensure that youth and adults have access to current, high-quality labor market, career, and educational information to help them plan their careers. Where appropriate, these efforts should expand the Career Information Delivery Systems developed by State Occupational Information Coordinating Committees, but move beyond these systems to assure that integrated career development programs are an essential part of school-to-work systems. Funding for expanded career development systems should include coordination with Federal initiatives to consolidate various job training programs and develop one-stop career counseling centers.

However, in many cases, there simply is not enough information available to help young people make appropriate decisions about their occupational futures. When, for example, students are unaware of the information available to them, when they cannot plan or make decisions on their own, or when they have little knowledge of employment and employment prerequisites, then these different forms of information are inadequate. Career development, therefore, should be defined as a process during which individuals develop career identity, work maturity, and the ability to plan (Herr and Cramer, 1988). This conception is much broader than the duties of traditional school counselors or the provision of information. Ideally, career development should be a systematic process that is integrated into educational programs from the elementary grades through students' transition into employment. New Federal legislation should encourage activities consistent with this conception of career development, supporting programs that are

- activity- or experience-based, rather than based on information transfer only;
- integrated within programs of study, rather than provided by individuals (e.g., counselors) who are independent of the program;
- programmatic, extending over a period of time, rather than providing one-shot bursts of information; and
- developmental, allowing for differences among students and encouraging the capacities (e.g., the ability to plan, a future orientation, and the capacity to make decisions) that enable students to make use of career-related information.



Employers must be mobilized to collaborate in providing work-related education and training.

Federal legislation should encourage the development of various mechanisms to connect high schools, community colleges, and technical institutes more closely with employers. These might include improved placement efforts and student follow-up systems to provide information where students are employed. They should also include new arrangements for work-based learning.

The STWOA calls for a dramatic extension of work-based learning, and one of the most difficult problems will be to recruit employers to provide enough high-quality placements. Although most high school and college students already have paid jobs while in school, these jobs are seldom related to students' fields of study or career interests (Stone et al., 1990). If business firms are to provide work-based learning connected to schooling for large numbers of students, significant changes will have to occur. For example, employers will have to spend time developing training plans that are linked to the school curriculum, supplying extra supervision and mentoring for student trainees, providing opportunities for students to conduct special projects and develop generic work skills, and participating in evaluations of students' performance. In order to prepare students for careers in a learning-intensive economy, work-based learning should occur in workplaces that make learning part of the work process (Phelps and Jacobs, 1994).

In addition to offering work-based learning opportunities for students, new programs also call upon employers to make other efforts. They must help schools develop career-oriented curriculum. Also, they will be asked to provide opportunities for teachers, especially teachers in non-vocational subjects, to become familiar with the workplace. And they must participate in formulating new skill standards, and commit themselves to recognizing and rewarding individuals who have achieved certification.

Employer participation in other countries is encouraged by various types of legal institutions and regulations such as high minimum wages (with exceptions for apprentices), mandatory membership (with associated dues) in employer organizations, and common standards for apprenticeship training. However, these types of regulatory inducements for employer participation seem unlikely in this country. Federal legislation therefore must encourage employer participation through facilitation and leadership (Bailey, 1993).

Industry-based employer organizations can play a crucial role in recruiting their members. Furthermore, industry organizations have a strong interest in strengthening the skill base available to their industry. Thus, legislation could encourage employer organizations to become involved (perhaps through funding guidelines to the states)

in developing and implementing work-based education. Legislation might also establish a high-profile group of employers (including owners of small businesses) to encourage their colleagues to participate (Bailey, forthcoming).

Schools, meanwhile, can and do provide work-based learning on their own through school-based enterprises. Schools engage students in such activities as rehabilitating old houses, collecting data on local environmental quality, running restaurants, publishing books and magazines, providing child care, and rebuilding cars. There is evidence that school-based enterprises offer more opportunity than outside jobs to learn new skills and to apply what has been taught in school (Stern et al., 1994a). Although effective school-based enterprises turn to local employers for advice and support, it may be easier for employers to provide that assistance to school-based enterprises than to offer work-based learning opportunities themselves.

Performance measures and standards should continue to be used to gauge the success of programs and guide their continuous improvement; these program measures should incorporate newly developing academic and occupational skill standards for individuals.

By requiring states to develop performance measures and standards, the 1990 Amendments to the Carl Perkins Act helped educational institutions shift from a concern with inputs and process-related standards to outcomes. In the first round, states appear to have done a good job of developing performance measures (Hoachlander, Levesque, and Rahn, 1992), but their local implementation has lagged. In addition, the systems of measures and standards developed so far have often been unconnected with the other components of the 1990 Amendments (e.g., with tech-prep programs or the treatment of special populations), and states have paid little attention to how data will be used to promote program improvement (Stecher et al., 1994; Stecher and Hanser, 1993). New Federal legislation should therefore stress the continued development of performance measures and standards to improve accountability; however, it should concentrate on local implementation of outcome measures to provide feedback to both students and educational institutions in the interests of program improvement.

In addition, the development of accountability measures has now proceeded to the point that several problems have emerged requiring Federal attention. For instance, some states have not yet addressed the measurement problems inherent in some outcome measures (e.g., gains in academic skills at the postsecondary level), and the

reliability and validity of outcome measures have not been carefully examined. Many of these problems are too large or technical for states to address without Federal help. Moreover, states are currently swamped by conflicting demands and will flounder without explicit guidance about how to reconcile different accountability systems; at the local level, teachers and administrators are often bewildered by the different assessments and standards they face (Little, 1992). While Federal legislation should continue to develop performance standards, Federal efforts should consider carefully the ways in which they reinforce or conflict with other standards. Also, the Federal government could help convene the various groups that are developing assessments to explore ways to make them consistent.

Performance measures and standards for programs should be connected to occupational and industrial skill standards for individuals, as these are developed. Such standards can help students understand what they need to learn, help schools decide what they need to teach, and give employers a stronger sense of the skills and abilities of applicants. Developing and administrating systems of skill standards will also provide a natural forum for cooperation between schools and employers. Skill standards should have the following characteristics: 1) They must be easily updated. 2) They must be specific enough to be a meaningful indication of the skills and abilities of workers and students, yet broad enough to allow job mobility and flexibility. 3) They must help students prepare for emerging jobs rather than declining jobs. 4) Workers, unions, employers, and educators must be involved in developing, implementing, and administrating skill standards systems. 5) They must be widely recognized and accepted by students, employers, and educational institutions. While these issues are being considered by the current pilot projects and may be addressed by the National Skill Standards Board to some extent, there has been little discussion so far about how curriculum and in-school as well as on-the-job pedagogy must change to reflect the standards (Bailey and Merritt, 1994).

In the first round, states appear to have done a good job of developing performance measures, but their local implementation has lagged. . . . [T]he systems of measures and standards developed so far have often been unconnected with the other components of the 1990 Amendments, . . . and states have paid little attention to how data will be used to promote program improvement.

Finally, performance standards for career-oriented education and training programs must also be linked to academic skill standards for individual students. The Goals 2000: Educate America Act established a process for creating standards that reflect the nation's goals for education. Some of these goals relate to performance in particular academic subjects, while others refer to more general thinking skills and preparation to compete in the world economy. All of these goals are relevant to career-focused education and training programs in schools and colleges and for youth and adults who are not in school.

While Federal funds should be distributed in greater amounts to low-income areas, states should be encouraged to develop their own programs of technical assistance for program improvement, including the possibility of targeting funds on high-performing programs.

Federal legislation should continue to direct funds to communities with the greatest levels of need as measured by income, but should resist targeting funds on specific groups of students. This does not prevent such programs from spending resources specifically on high-need students—for example, for enriched instruction if certain students lack the writing or math competencies necessary for advanced occupational clusters. The Federal funds should be used to assure that programs simultaneously achieve high quality and allow all students access.

With the 1990 Amendments to the Carl Perkins Act, Federal policy seems to have found a reasonably effective strategy for controlling how states distribute Federal dollars (Klein et al., 1994). However, several funding-related issues merit further attention. First, because Federal funds largely bypass the state, there is insufficient state-level capacity to support major Federal priorities. Yet there is evidence that reforms have been more substantial in states with strong technical assistance for local schools and colleges (NAVE, 1994, Vol. I). Issues that are probably best addressed at the state level include curriculum development, teacher education, staff development, assessment and program improvement, and secondary/postsecondary articulation (including attention to college admission requirements and other postsecondary policies). New Federal legislation should therefore allow states to spend higher proportions of state allocations for technical assistance, as long as such spending is carefully connected to the program improvement efforts specified in Federal legislation.

It may also be desirable to allow states to concentrate Federal funds more than is now possible. For example, states could use Federal funds to support a few well-developed and carefully evaluated schools and colleges, or schools-within-schools such as career academies and clusters, rather than provide small amounts of funding insufficient to support substantial reforms. Also, some funds might be awarded to districts on a competitive basis.

However, new legislation permitting states greater authority to develop appropriate state activities, while promoting program improvement, should also streamline the application and approval process. The current process has become unwieldy; it focuses on developing lengthy state plans without the appropriate emphasis on reform and improvement, and absorbs resources that would be better spent on advancing career-related education.

Collaboration among career-related education and training programs in different institutions, or with different funding sources, is desirable and can be facilitated if all programs adhere to the same principles, such as those stated in principle 1 above.

Collaboration across different Federal programs is difficult to achieve, because they often serve different purposes or client populations. However, there are some opportunities for collaboration related to work-centered education that have not yet been well-developed, which could be encouraged by new Federal legislation. For example, Federal agencies that support curriculum development, like the National Science Foundation and the Fund for the Improvement of Postsecondary Education, could support the creation of career-related curriculum materials as part of their portfolios of new curricula. This would avoid the present necessity for every local program to develop its own curriculum virtually from scratch.

While such economies of scale should be sought, they would not address the complex problems and possible inconsistency caused by the fact that a number of different Federal education and training programs do exist. To coordinate programs that appear similar, consolidation may seem to be a simple solution. However, Federal programs in the area of work-related education and job training often have quite different objectives; as a result, there is remarkably little "waste and duplication," despite discussion to the contrary (NAVE, 1994, Vol. V, Ch. 3; Bailis and Grubb, 1993; Grubb et al., 1989, 1990; Grubb and McDonnell, 1991; Trutko, Bailis, and Barnow, 1989). Consolidation by itself would be unlikely to eliminate what waste there is, or to create more effective programs.

To increase effectiveness, we propose that the key elements outlined under principle 1 be applied in all Federally supported education and training programs. These features—combining academic and vocational education, connecting classroom instruction with work-based learning, and linking every program to the others in a sequence (as tech prep does)—offer various learning opportunities, connections to employment, and links to further education and training.

Currently, however, most Federal job training programs fail to attain this vision. For example, the Adult Education Act usually funds adult remedial programs that are free-standing, unconnected to either vocational skills training, work-based instruction, or higher level programs. And these remedial programs usually use outdated modes of didactic instruction, often because they are driven by the GED (Grubb and Kalman, 1994). Job Training Partnership Act (JTPA) programs often fund on-the-job training, which is intended to be a form of work-based learning. However, the learning on the

job is often insubstantial (Kogan et al., 1989), and it is unconnected to remedial academic or vocational skills training and to any further training opportunities. Also, JTPA programs tend to use rote and didactic teaching. JOBS programs sometimes support client-initiated programs, and at their best can provide various support services (e.g., child care), remediation, and instruction through community colleges. But in other cases, clients receive job search assistance without either academic or vocational skills training, or work-based learning—which is particularly inappropriate for individuals who lack both education and labor market experience because it does not prepare them to cope with change.

In addition to creating greater consistency among different programs, new Federal legislation should also try to establish links among programs. This would help ensure that the paths and the referral mechanisms from shorter, lower level programs to more advanced programs is clear to both providers and participants.

Requiring collaboration in order to achieve greater coherence will entail some politically difficult decisions. For example, the principle of requiring links among academic and vocational skills training and between lower level and more advanced programs suggests that isolated agencies providing only a single service (short-term remediation, narrow vocational skills training, or job search assistance) should no longer be funded, unless they are clearly cost-effective. Instead, there is a presumption in favor of funding institutions like community colleges or stable consortia of local institutions that can provide a variety of well-connected services.

Collaboration to achieve greater coherence and consistency among Federal programs ought to improve their ability to help youth and adults participate as lifelong learners in a changing economy. Such collaboration requires a well-defined framework, the articulation of which is a primary challenge for new Federal legislation.

REFERENCES

Andrew, E., and Grubb., W.N. (1995). The power of curriculum integration: Its relationship to other reforms. In W.N. Grubb (Ed.), *Education through occupations: Integrating academic and vocational education in American high schools* (Vol. I). New York: Teachers College Press.

Bailis, L., and Grubb., W.N. (1993, March). *Summing it all up: Lessons from the research literature on ways to promote coordination between vocational education and job training programs* (Report prepared for the National Assessment of Vocational Education, U.S. Department of Education). Berkeley: National Center for Research in Vocational Education, University of California.

Bailey, T. (1990). *Jobs of the future and the skills they will require: New thinking on an old debate* (Reprint MDS-213). Berkeley: National Center for Research in Vocational Education, University of California.

Bailey, T. (1993, April). Youth apprenticeship in the context of broad education reform. *Education Researcher, 22*(3), 16–17.

Bailey, T. (Ed.). (forthcoming). *Incentives for employer participation in school-to-work programs*. Washington, D.C.: Brookings Institution.

Bailey, T. and Merritt, D. (1994, January). *Making sense of industry-based skills standards* (Paper prepared for the National Center for Research in Vocational Education). New York: Teachers College, Columbia University.

Baker, E.T., Wang, M.C., and Walberg, H.J. (1994, December–1995, January). The effects of inclusion on learning. *Educational Leadership 52*(4), 33–35.

Bragg, D.D., Layton, J.D., and Hammons, F.D. (1994, September). *Tech prep implementation in the United States: Promising trends and lingering challenges*. Berkeley: National Center for Research in Vocational Education, University of California.

Brown, C., Reich, M., and Stern, D. (1991). *Skills and security in evolving employment systems: Observations from case studies* (MDS-131). Berkeley: National Center for Research in Vocational Education, University of California.

Crain, R.L, Heebner, A.L., Si, Y.P., Jordan, W.J., and Kiefer, D.R. (1992). *The effectiveness of New York City's career magnet schools: An evaluation of ninth grade performance using an experimental design* (MDS-173). Berkeley: National Center for Research in Vocational Education, University of California.

Cuban, L. (1990, January). Reforming again, again, and again. *Educational Researcher, 19*(1), 3–13.

Cuban, L. (1993). *How teachers taught: Constancy and change in American classrooms 1890–1990*. New York: Teachers College Press.

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan.

Eagle, E., Choy, S., Hoachlander, E.G., Stoddard, S., and Tuma, J. (1989). *Increasing vocational options for students with learning handicaps: A practical guide* (MDS-003). Berkeley: National Center for Research in Vocational Education, University of California.

Finch, C.R., Reneau, C.E., Faulkner, S.L., Gregson, J.A., Hernandez-Gantes, V., and Linkous, G.A. (1992). *Case studies in vocational education administration: Leadership in action* (MDS-279). Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N. (1992). Postsecondary vocational education and the sub-baccalaureate labor market: New evidence on economic returns. *Economics of Education Review, 11*(3), 225–248. "Corrections and extensions" (forthcoming).

Grubb, W.N. (1993). The varied economic returns to postsecondary education: New evidence from the class of 1972. *Journal of Human Resources, 28*(2), 365–382. "Response" (forthcoming, winter 1995).

Grubb, W.N., and McDonnell, L.M. (1991). *Local systems of vocational education and job training: Diversity, interdependence, and effectiveness*. Santa Monica and Berkeley: RAND and the National Center for Research in Vocational Education, University of California.

Grubb, W.N., and Stasz, C. (1993). *Integrating academic and vocational education: Progress under the Carl Perkins Amendments of 1990* (Prepared for the National Assessment of Vocational Education, U.S. Department of Education). Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N. (1994, March). *The returns to education and training in the sub-baccalaureate labor market: Evidence from the survey of income and program participation*. Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N., and Kalman, J. (1994, November). Relearning to earn: The role of remediation in vocational education and job training. *American Journal of Education*, 103(1), 54–93.

Grubb, W.N., Brown, C., Kaufman, P., and Lederer, J. (1989, April). *Innovation versus turf: Coordination between vocational education and Job Training Partnership Act programs* (Report prepared for the U.S. Congress, the Secretary of Education, and the Secretary of Labor). Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N., Brown, C., Kaufman, P., and Lederer, J. (1990, August). *Order amidst complexity: The status of coordination among vocational education, Job Training Partnership Act, and Welfare-to-Work programs* (Report prepared for the U.S. Congress, the Secretary of Education, and the Secretary of Labor). Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N., Davis, G., Lum, J., Plihal, J., and Morgaine, C. (1991, August). *"The cunning hand, the cultured mind": Models for integrating academic and vocational education.* Berkeley: National Center for Research in Vocational Education, University of California.

Grubb, W.N., Dickinson, T., Giordano, L., and Kaplan, G. (1992, December). *Betwixt and between: Education, skills, and employment in the sub-baccalaureate labor market.* Berkeley: National Center for Research in Vocational Education, University of California.

Hansen, J. (1994). *Preparing for the workplace: Charting a course for federal postsecondary training policy* (Prepared for the Committee on Postsecondary Education and Training for the Workplace, National Research Council). Washington, D.C.: National Academy Press.

Herr, E.L., and Cramer, S.H. (1988). *Career guidance and counseling through the life span* (3rd ed.). Glenview, IL: Harper-Collins.

Hill, P., Foster, G., and Gendler, T. (1990). *High schools with character.* Santa Monica: RAND.

Hoachlander, E.G. (1994). Industry-based education: A new approach for school-to-work transition. In *School-to-work: What does research say about it?* (pp. 77–96). Washington, D.C.: Office of Educational Research and Improvement, U.S. Department of Education.

Hoachlander, E.G., Levesque, K., and Rahn, M.L. (1992). *State systems for accountability in vocational education* (MDS-491). Berkeley: National Center for Research in Vocational Education, University of California.

Jacobs, H.H. (Ed.). (1989). *Interdisciplinary curriculum: Design and implementation.* Alexandria, VA: Association for Supervision and Curriculum Development.

Kane, T., and Rouse, C. (1993, December). *Labor market returns to two- and four-year college: Is a credit a credit and do degrees matter?* (Working paper #311). Princeton, NJ: Industrial Relations Section, Princeton University.

Klein, S., Hoachlander, G., Teben, C., and Premo, M. (1994). *State allocation of basic grant funds: A comparison of the Carl D. Perkins Acts of 1984 and 1990* (Prepared for the National Assessment of Vocational Education, U.S. Department of Education). Berkeley: MPR Associates.

Kogan, D. et al. (1989, November 15). *Improving the quality of training under JTPA* (Prepared for the U.S. Department of Labor). Berkeley: Berkeley Planning Associates and SRI International.

Little, J. (1992). *Two worlds: Vocational and academic teachers in comprehensive high schools.* Berkeley: National Center for Research in Vocational Education, University of California.

Little, J., and Threatt, S. (1992). *Work on the margins: The experience of vocational teachers in comprehensive high schools.* Berkeley: National Center for Research in Vocational Education, University of California.

Maddy-Bernstein, C., and Coyle-Williams, M. (in press). Addressing diversity in the classroom. In Grubb, W.N. (Ed.), *The workplace in the classroom: Integrating vocational and academic education.* New York: Teachers College Press.

Maddy-Bernstein, C., Cunanan, E.S., and Mikulin, E. (1994). *Program improvement and accountability systems for special populations.* Berkeley: National Center for Research in Vocational Education, University of California.

McDonnell, L.M., and Zellman, G.L. *Education and training for work in the fifty states: A compendium of state policies.* Berkeley and Santa Monica: National Center for Research in Vocational Education, University of California and RAND.

Meier, D. (1991, September 23). The little schools that could. *The Nation.*

National Assessment of Vocational Education (NAVE) (1994). *Final report to Congress* (Vols. I–V). Washington D.C.: Office of Educational Research and Improvement, U.S. Department of Education.

O'Neil, J. (1993, June). Can separate be equal? Educators debate merits, pitfalls of tracking. *Curriculum Update* (Special issue). Alexandria, VA: Supervision and Curriculum Development.

Oakes, J., Selvin, M., Karoly, L., and Guiton, G. (1992). *Educational matchmaking: Academic and vocational tracking in comprehensive high schools* (MDS-127). Berkeley: National Center for Research in Vocational Education, University of California.

Phelps, L.A., and Jacobs, J. (1994). Incentives and strategies for private sector participation. In Phelps, L.A. (Ed.), *Employers and school-to-work: Policy options for the Great Lakes States*. Madison, WICenter on Education and Work, University of Wisconsin.

Phelps, L.A., and Wermuth, T.R. (1992). *Effective vocational education for students with special needs* (MDS-112). Berkeley: National Center for Research in Vocational Education, University of California.

Raizen, S.A. (1989). *Reforming education for work: A cognitive science perspective* (MDS-024). Berkeley: National Center for Research in Vocational Education, University of California.

Schmidt, B.J. (1992). *Collaborative efforts between vocational and academic teachers: Strategies that facilitate and hinder the efforts* (MDS-164). Berkeley: National Center for Research in Vocational Education, University of California.

Stasz, C., Ramsey, K., Eden, R., DaVanzo, J., Farris, H., and Lewis, M. (1992). *Classrooms that work: Teaching generic skills in academic and vocational settings* (MDS-263). Berkeley: National Center for Research in Vocational Education, University of California.

Staub, D., and Peck, C.A. (1994, December–1995, January). What are the outcomes for nondisabled students? *Educational Leadership, 52*(4), 36–40.

Stecher, B.M., and Hanser, L.M. (1993). *Beyond vocational education standards and measures: Strengthening local accountability systems for program improvements*. Berkeley: National Center for Research in Vocational Education, University of California.

Stecher, B.M., Rahn, M.L., Hanser, L.M., Levesque, K., Hallmark, B., Hoachlander, E.G., Emanuel, D., and Klein, S. (1994). *Improving Perkins II performance measures and standards: Lessons from early implementers in four states*. Berkeley and Santa Monica: National Center for Research in Vocational Education, University of California and RAND.

Stern, D., Raby, M., and Dayton, C. (1992). *Career academies: Partnerships for reconstructing American high schools*. San Francisco: Jossey-Bass.

Stern, D., Stone, J.R., Hopkins, C., McMillion, M., and Crain, R. (1994a). *School-based enterprise: Productive learning in American high schools.* San Francisco: Jossey-Bass.

Stern, D., Finkelstein, N., Stone, J.R., Latting, J., and Dornsife, C. (1994b). *Research on school-to-work transition programs in the United States* (MDS-771). Berkeley: National Center for Research in Vocational Education, University of California.

Stone, J.R., Stern, D., Hopkins, C., and McMillion, M. (1990). *Adolescents' perceptions of their work: School-supervised and non-school-supervised* (Reprint MDS-317). Berkeley: National Center for Research in Vocational Education, University of California.

Trutko, J., Bailis, L., and Barnow, B. (1989). *An assessment of the JTPA role in state and local coordination activities* (Vol. I). (Draft final report prepared for the Employment and Training Administration, U.S. Department of Labor). Washington, D.C.: James Bell Associates and Lewin/ICF.

NCRVE

The National Center for Research in Vocational Education

The National Center for Research in Vocational Education (NCRVE) is the nation's largest center for research and development in work-related education. Headquartered at the University of California at Berkeley since 1988, NCRVE is a consortium of eight institutions. NCRVE has focused its mission on strengthening education to prepare all individuals for lasting and rewarding employment.

NCRVE believes such education:

- should offer every student the option of a high-quality, career-related course of study;
- integrates curricula, maintaining an emphasis on learning through applied problem-solving—a strong feature of traditional vocational education—while including a rigorous course of academic study; and
- simultaneously prepares students for immediate employment, further education, and lifelong learning.

NCRVE Headquarters, University of California at Berkeley

David Stern, Director
Phyllis Hudecki, Associate Director
Olivia Moore, Deputy Director

Susan Faulkner, Professional Development
Carolyn Maddy-Bernstein, Student Services
Erika Nielsen Andrew, Program Development
Peter Seidman, Dissemination

2150 Shattuck Avenue, Suite 1250, Berkeley, CA 94720-1674
(800) 762-4093 (510) 642-4004
principles@vocserve.berkeley.edu

NCRVE Sites

University of California, Berkeley, CA
W. Norton Grubb, Site Director
(510) 642-3488
norton_grubb@maillink.berkeley.edu

University of Illinois, Champaign, IL
Mildred Griggs, Site Director
(217) 333-4318
mildredb@ux1.cso.uiuc.edu

MPR Associates, Berkeley, CA
Gary Hoachlander, Site Director
(510) 849-4942
ghoachlander@mprinc.com

University of Minnesota, St. Paul, MN
Charles R. Hopkins, Site Director
(612) 624-5313
hopki003@maroon.tc.umn.edu

RAND, Santa Monica, CA
Cathy Stasz, Site Director
(310) 393-0411, Ext. 6326
cathy@rand.org

Teachers College, Columbia University, New York, NY
Thomas Bailey, Site Director
(212) 678-3091
mbc15@columbia.edu

Virginia Polytechnic Institute and State University, Blacksburg, VA
Curtis Finch, Site Director
(703) 231-8175
ncrve@vtvm1.cc.vt.edu

University of Wisconsin, Madison, WI
L. Allen Phelps, Site Director
(608) 263-3696
aphelps%cew@mail.soemadison.wisc.edu

Editor, Andrea Livingston
Graphic Designer, Leslie Retallick

Photographs © PhotoDisc™ 1994